

New data on π^0 meson production...

S/056/63/044/002/052/065
B184/B102

1 figure and 1 table.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki Akademii
nauk SSSR (Institute of Theoretical and Experimental Physics
of the Academy of Sciences USSR)

SUBMITTED: November 2, 1962

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ACCESSION NR: AP4009109

S/0056/63/045/006/1879/1890

AUTHORS: Barmin, V. V.; Dolgolenko, A. G.; Krestnikov, Yu. S.;
Meshkovskiy, A. G.; Nikitin, Yu. P.; Shebanov, V. A.

TITLE: Observation of the decay

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 45, no. 6, 1963,
1879-1890

TOPIC TAGS: Omega meson decay, Omega meson charge parity, radiative
decay, Omega meson width, Omega neutral particle decay, pion proton
interaction, negative pion proton interaction

ABSTRACT: The reaction $\pi^- + p \rightarrow n + \omega \rightarrow n + \pi^0 + \gamma$ was investigated
for negative-pion momenta of 1.25, 1.55, and 2.8 BeV/c in a 17-
liter propane-xenon bubble chamber. The purpose of the investiga-
tion was to detect the decay $\omega \rightarrow \pi^0 + \gamma \rightarrow 3\gamma$, the existence of
which was established on the basis of the excess of number of events

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with three γ -rays as compared with the number of background events from the reactions $\pi^- + p \rightarrow n + m\pi^0$ ($m \geq 2$), and was further confirmed by a statistical method based on the kinematics of the $\omega \rightarrow \pi^0 + \gamma$ decay. The cross sections for the reaction under study were estimated in the indicated momentum interval. "In conclusion, we express our deep gratitude to A. I. Alikhanov for constant interest and valuable advice. We thank the ITEP (Institute of Theoretical and Experimental Physics) proton synchrotron crew who enabled us to obtain the large number of photographs in a short time. We thank I. Ya. Pomeranchuk, L. B. Okun', I. Yu. Kobzarev, B. L. Ioffe, Yu. A. Simonov, and A. S. Zhizhin for fruitful theoretical discussions. We are very indebted to A. S. Kronrod, R. S. Guter, and Ye. M. Landis for valuable advice and for organizing and carrying out the calculations on the ITEP electronic computer. We thank the scanning staff under the direction of V. P. Romyantseva for scanning the pictures, Yu. I. Makarov, N. S. Khropov, and B. I. Chistyakov for operating the bubble chamber, Yu. V. Trebukhov-

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ACCESSION NR: AP4009109

skiy for aid in the work and V. V. Vladimirskiy for helpful discussion of the results. Orig. art. has: 8 figures, 27 formulas, and 2 tables.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki
(Institute of Theoretical and Experimental Physics)

SUBMITTED: 03Jul63

DATE ACQ: 02Feb64

ENCL: 00

SUB CODE: PH

NO REF SOV: 003

OTHER: 010

Card 3/3

ACCESSION NR: AP4009142

S/0056/63/045/006/2082/2084

AUTHORS: Barmin, V. V.; Dolgolenko, A. G.; Krestnikov, Yu. S.;
Meshkovskiy, A. G.; Shebanov, V. A.

TITLE: Search for the $\omega \rightarrow e^+ + e^-$ decay

SOURCE: Zhurnal eksper. i teoret. fiziki, v. 45, no. 6, 1963,
2082-2084

TOPIC TAGS: Omega meson, Omega meson decay, negative pion proton
interaction, bubble chamber, proton synchrotron, three pion decay

ABSTRACT: An attempt is made to observe the decay $\omega \rightarrow e^+ + e^-$ ex-
perimentally by the authors earlier (ZhETF v. 45, 1878, 1963) in a
17-liter xenon-propane bubble chamber exposed to 1.55 and 2.8 BeV/c
negative pion beams from the proton synchrotron at the Institut
teoreticheskoy i eksperimental'noy fiziki (Institute of Theoretical
and Experimental Physics). The chamber was operated without a mag-

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ACCESSION NR: AP4009142

netic field, with 20,000 pictures at 1.55 BeV/c and 40,000 pictures at 2.8 BeV/c scanned independently. Four two-prong stars were found to satisfy completely all the selection criteria, along with three doubtful cases. Reasons are advanced for assuming that all seven two-prong stars are cases of the reaction $\pi^- + p \rightarrow n + \omega$ with the subsequent $\omega \rightarrow e^+ + e^-$ decay of the ω meson. The sources of background reactions are analyzed. The value obtained for the ratio of the probability of this decay to the three-pion decay is found to be $(0.40^{+0.15}_{-0.30}) \times 10^{-2}$, which agrees well with the theoretical predictions. "We are deeply grateful to A. I. Alikhanov for his constant interest in the work and for valuable advice, to the scanning department of the Institute of Theoretical and Experimental Physics for scanning the photographs, to Ya. S. Yelenskiy for an experimental determination of the scanning efficiency for electrons in a chamber, and to I. Yu. Kobzarev and Yu. P. Nikitin for discussions. Orig. art. has: 2 figures and 2 formulas.

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ACCESSION NR: AP4009142

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki
(Institute of Theoretical and Experimental Physics)

SUBMITTED: 09Oct63

DATE ACQ: 02Feb64

ENCL: 00

SUB CODE: PH

NO REF SOV: 002

OTHER: 004

Card 3/3

ACCESSION NR: AP4012534

S/0056/64/046/001/0142/0147

AUTHORS: Barmin, V. V.; Dolgolenko, A. G.; Krestnikov, Yu. S.; Meshkovskiy, A. G.; Shebanov, V. A.

TITLE: An investigation of the charge exchange $\pi^- + p \rightarrow n + \pi^0$ and $\pi^- + p \rightarrow n + \eta$ ($\eta \rightarrow 2\gamma$) reaction in the 1.55--4.5 BeV/c region

SOURCE: Zhurnal eksper. i teoret. fiz., v. 46, no. 1, 1964, 142-147

TOPIC TAGS: pion proton interaction, negative pion proton interaction, pion proton charge exchange, Eta meson production, neutral pion angular distribution, pion angular distribution, backward scattering, backward charge exchange, backward exchange scattering

ABSTRACT: The reactions were investigated with a 17-liter propane-xenon bubble chamber with an aim at checking on the theoretical prediction by L. B. Okun' and I. Ya. Pomeranchuk (ZhETF, v. 30, 424, 1956) that a considerable decrease takes place in the exchange scat-

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ACCESSION NR: AP4012534

tering with increasing π^- meson energy. The number of pictures scanned were 20,000, 60,000 and 20,000 at momenta 1.55, 2.8, and 4.5 BeV/c. The charge exchange reaction cross sections were found to be 3.0, 1.54 ± 0.37 , 0.36 ± 0.09 , and 0.19 ± 0.12 mb for 1.14, 1.55, 2.80, and 4.50 BeV/c. The η -meson production cross sections for the same momenta are 0.5, 0.32 ± 0.22 , 0.08 ± 0.07 , and 0.05 ± 0.07 , respectively. From these values, and from the angular distribution of the π^0 meson in the charge-exchange reaction, it was found that the differential cross section for backward exchange scattering is 0.04 ± 0.02 mb/sr for 1.5 BeV/c and 0.008 ± 0.005 mb/sr for 2.8 BeV/c. "In conclusion we are deeply grateful to A. I. Alikhanov for continuous interest and for valuable advice, and to I. Ya. Pomeranchuk and V. V. Vladimirovskiy for a discussion of the results. We are grateful to the ITEP proton synchrotron crew for providing a large number of photographs within a short time. We are very indebted to L. M. Voronina, V. N. Dez, and N. A. Ivanova for carrying out the computations with the ITEP electronic computer. Orig. art. has: 3

Card 2/3

ACCESSION NR: AP4012534

figures, 4 formulas and 3 tables.

ASSOCIATION: Institut teoreticheskoy i eksperimental'noy fiziki
(Institute of Theoretical and Experimental Physics)

SUBMITTED: 30Jul63

DATE ACQ: 26Feb64

ENCL: 00

SUB CODE: PH

NO REF SOV: 006

OTHER: 004

Card 3/3

BARMIN, V.V.; DOLGOLENKO, A.G.; KRESTNIKOV, Yu.S.; MESHKOVSKIY, A.G.;
NIKITIN, Yu.P.; SHEBANOV, V.A.

Evidence of $\omega \rightarrow \pi^0 + \gamma$ decay. Zhur. eksp. i teor. fiz. 45
no.6:1879-1890 D '63. (MIRA 17:2)

1. Institut teoreticheskoy i eksperimental'noy fiziki.

BARMIN, V.V.; DOLGOLENKO, A.G.; KRESTNIKOV, Yu.S.; MESHLOVSKIY, A.G.;
SHEBANOV, V.A.

Searching for $\omega \rightarrow e^+ + e^-$ decay. Zhur. eksp. i teor. fiz.
45 no.6:2082-2084 D '63. (MIRA 17:2)

1. Institut teoreticheskoy i eksperimental'noy fiziki.

24.2120

69431
S/139/60/000/01/005/041
E201/E491

AUTHORS: Kholev, S.R. and Krestnikova, L.I.

TITLE: Experimental Investigation of Directed Flow of Gas in
Pulse Discharges 21

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,
1960, Nr 1, pp 29-37 + 4 plates (USSR)

ABSTRACT: The present paper deals with slowly decaying shock waves produced by pulse discharges. These waves were studied as a function of the initial pressure in a discharge tube, nature of the gas used, and parameters of the discharge circuit. Discharges were produced in a cylindrical Plexiglas tube (50 mm diameter, 270 mm length and 9 mm thickness) with steel electrodes: a central "point" electrode and a tube-shaped one (Fig 1). The electrical circuit (Fig 1) consisted of a capacitor bank C_1 , a pure resistance R , a discharge gap ShR and brass bus-bars of 50 x 1 mm cross-section. Two types of capacitor bank were used: a high-voltage one with total capacitance of 5 μF charged up to 30 kV, and a low-voltage one with total capacitance of 239 or 660 or

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S/139/60/000/01/005/041
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Experimental Investigation of Directed Flow of Gas in Pulse
Discharges

1315 μ F charged to 3.2 kV. Currents and voltages were measured with cathode-ray oscillographs to within 5% (Fig 5, 6 and 9). Rates of propagation of self-luminous shock waves were recorded with a cine camera (cf plates in Fig 2 to 4 and 8) with an accuracy of $\sim 3\%$ at flow velocities of 2 to 3 km/sec and $\sim 10\%$ at velocities of 10 km/sec. Pulses were passed through the discharge tube filled either with air, argon or hydrogen at pressures from 0.1 to 50 mm Hg. Multiple direct shock waves were produced by successive oscillations of the discharge. The frequencies of these oscillations were about 40 kc/s in high-voltage discharges and about 3.6 kc/s in low-voltage discharges. Reflected shock waves were also observed. Similar results were obtained for air, argon and hydrogen. In low-voltage discharges, variation of capacitance from 239 to 1315 μ F did not affect the nature of the main direct shock wave. Shock-wave velocities

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E201/E491

Experimental Investigation of Directed Flow of Gas in Pulse Discharges

temperatures in the wavefront region were of the order of 10000°K (Table 1). The main shock wave in high-voltage discharges slowed down as it travelled along the discharge tube, in contrast to low-voltage discharges where this shock wave accelerated during its travel. This indicated an essential difference between high-voltage and low-voltage discharges: the former were explosion-like with practically instantaneous liberation of energy, the latter could be likened to motion of a piston with energy supplied at a much slower rate. There are 9 figures, 3 tables and 12 references, 7 of which are Soviet, 4 English and 1 a translation from English into Russian.

ASSOCIATION: Moskovskiy gosuniversitet imeni M.V.Lomonosova
(Moscow State University imeni M.V.Lomonosov)

SUBMITTED: February 9, 1959
Card 3/3

VIL'DT, Ye.O.; KNESTRIKOVA, N.I.; OVECHKIS, N.S.; SADOV, F.I.

Development of the three-color textile printing; color gamut of the
color triad for three-color printing. Izv.vys.ucheb.zav.; tekhn.tekhn.
prom. no.1:103-109 '63. (MIRA 16:4)

1. Moskovskiy tekstil'nyy institut.
(Textile printing)

1. MORACHEVSHIY, I. I. - ANGENITSKAYA, R. B. - ^IKRESNIKOVA, V. V. -
MOYSEYENKO, YA. P. - KIPNIS, I. I. _^
2. USSR (600)
4. Water Pipes
7. Ceramic pipes for pressure pipelines. Stek. i ker. 9 no. 12, 1952

9. Monthly List of Russian Accessions, Library of Congress, March 1953, Unclassified.

MORACHEVSKIY, I.I., kandidat tekhnicheskikh nauk; ANGENITSKAYA, R.B., kandidat tekhnicheskikh nauk; KRESTNIKOVA, V.V., inzhener; NOYSEYENKO, Ya.F.; KIPNIS, I.I.

Clay pipe used for pressure pipe lines. Biul.stroi.tekh. 10 no.3:22-24
P '53. (MLBA 6:12)

1. Institut stroitel'nykh materialov Ministerstva Promyshlennosti Stroitel'-
nykh Materialov, (Pipe, Clay)

Krestnikova, V.V.

1. The material is a
clay. It is a mixture of
clay and water. The water
content is 10-15% (of dry
weight). The clay is
of the type of kaolin.
It is used for making
tiles. The tiles are
made by pressing the
clay into a mold and
then drying them.

2. The tiles are
made by pressing the
clay into a mold and
then drying them. The
tiles are made of a
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content is 10-15% (of
dry weight). The clay
is of the type of
kaolin.

km

КНИЖНИК-44, 7С-14.

1. SLAVIANSTY, V. T., PRESTETKOVA, E. N.

2. USSR (600)

4. Boron Oxide

7. Viscosity of boron oxide as a substance used for graduation of viscosimeters.
Zhur. fiz. khim. 26, no. 12, 1952.

9. Monthly List of Russian Accessions, Library of Congress, May 1953. Unclassified.

KRESTNIKOVA, YE. N.

3
(2)

Method of analyzing gas bubbles in glass less than 0.2 mm. in diameter. V. T. SLAVYANSKI AND E. N. KRESTNIKOVA. *Sleklo i Keram.* 10 [11] 11-15 (1953).—The glass sample is crushed between concave and convex lenses, and the gas is absorbed by glycerin on the concave lens. The gas is evacuated from the glycerol through a microburette and passes successively into absorbers. To eliminate the absorption of CO₂, experiments were conducted to determine the rate at which the diameter of the bubble decreases as a function of the diameter size and the CO₂ content. Results compared favorably with those obtained by the absorption of CO₂ in alkali. 10 figures. B.Z.K.

KRESTNIKOVA, Ye. N.

USSR/Chemistry - Physical chemistry

Card 1/1 : Pub. 147 - 18/21

Authors : Slavyanskiy, V. T., and Krestnikova, E. N.

Title : About the accuracy of measuring the viscosity of melted glass

Periodical : Zhur. fiz. khim. 8, 1497-1506, Aug 1954

Abstract : Investigations were conducted to determine the basic sources of errors originating during viscosity measurement of melted Si-glass at 900-1500°C. The average deviations of measured temperatures from actual temperatures were evaluated. The three groups of errors, originating during the measurement of viscosity of melted glass, are described. Proposals for further improvement of glass viscosity measuring methods are included. Nine references: 4-USSR; 3-German; 1-French and 1-USA (1926-1954). Tables; graphs.

Institution : ...

Submitted : February 15, 1954

KRESTNIKOVA, E. N.

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K Analysis of gas bubbles in glass. V. T. Slavyanskii and E. N. Krestnikova (Glass & Ceramics, Moscow, 1953, 10, No. 11, 11: Glass) have differing compositions and a technique is described for analysing single bubbles <0.2 mm. in diameter. The sample bubble is isolated by grinding a glass specimen, which is placed between the convex faces of two plano-convex lenses wetted with glycerol. After positioning (under the microscope) the bubble at the point of contact of the lenses it is broken by pressure applied through the lenses and the gas is released as a bubble in the glycerol. A micro-analysis is made by measuring the diameter of the bubble initially and after successive absorption by KOH and alkaline pyrogallol. Bubbles in a borosilicate glass contained 21-100% of CO₂ and 0-79% of O₂; no CO or H₂ was found. I. A. Suvorov.

(1)

SLAVYANSKIY, V.T.; NOVIKOVA, M.P.; ISAYEVA, L.V.; KRESTNIKOVA, Ye.N.

Effect of chemical composition on the viscosity of silica glass.

Opt.-mekh.prom. 25 no.1:53-58 Ja '58.

(MIRA 11:7)

(Glass manufacture)

, 15 (2)

AUTHORS: Slavyanskiy, V. T., Krestnikova, Ye. M., SOV/72-59-9-6/16
Proskuryakov, M. V.

TITLE: Investigation of Blister Formation During Glass-melting in a Vacuum

PERIODICAL: Steklo i keramika, 1959, Nr 2, pp 25 - 29 (USSR)

ABSTRACT: It has been established that there are two sources of blister formation in glass: gases which are contained in the pores of the ceramics and show a content of 80-90% nitrogen and 5-10% carbon dioxide and oxygen. These blisters can be reduced by reducing the corrosion and porosity of the refractory materials; the gases contained in the glass mass cannot be established as easily, since the gas composition within the blisters of non-ceramic origin differs considerably from the gases of the glass mass, as can be seen from the paper by V. T. Slavyanskiy (Footnote 1). During the reduction of temperature, oxygen and carbon dioxide are absorbed; the nitrogen, however, remains in the blisters, as established by V. V. Vargin and V. V. Pollyak (Footnote 2). The purpose of the present paper was to carry out the qualitative estimation of the gas contents in some optical borosilicate glass types. The melting tests of the glass under

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Investigation of Blister Formation During Glass-melting in a Vacuum

SOV/72-59-9-6/16

vacuum were carried out in a horizontal electrical furnace with a temperature drop of from 1200 to 700°. The furnace temperature was controlled by an automatic electronic potentiometer of the type EPD-17. The design of the furnace is shown in figure 1. The air exhaustion was obtained by a rotary oil pump of the type RVN-20, as can be seen from the scheme (Fig 2). Furthermore, the experiments with the optical glass types TK-10, BK-10, K-8, and F-8 are described in detail. The experimental results are shown in figures 3 to 6. Experiments were carried out in a platinum crucible to determine the influence of stirring up the glass types at 1400 and 1450°. The experimental results are shown in figures 7 and 8. In conclusion, the authors establish that blister formation in molten glass occurs possibly through over-saturation of the glass mass with gases. As shown by the experimental results, pressure variations in the industrial furnaces are of no influence on the blister formation in the glass. Various mechanical influences on the molten glass mass can, however, cause the formation of a great amount of blisters. There are 8 figures and 5 references, 4 of which are Soviet.

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3/072/62/000/011/001/001
B101/B186

AUTHORS: Slavyanskiy, V. T., Candidate of Chemical Sciences,
Krestnikova, Ye. N., Engineer, Boreyko, V. M., Engineer

TITLE: A new method of measuring glass viscosities in the 10^5 to 10^{14}
poise range

PERIODICAL: Steklo i keramika, no. 11, 1962, 18 - 22

TEXT: Reference is made to the inadequacy of measuring the viscosity of glass by stretching a heated glass rod. Even deviations of 0.02 - 0.03 mm in a 1-mm rod cause errors of measurement reaching 4 - 6 %. In glass of low viscosity, extension sets in before the glass has reached furnace temperature. No reliable method has existed for the 10^5 to 10^7 poise range.

Therefore, a new method of measuring the viscosity in the 10^5 - 10^{14} poise range is suggested which depends on submerging a loaded cylindrical rod into the heated glass. Tests on an experimental model showed that the depth of penetration is a linear function of time. On the basis of these findings several viscometers were constructed, comprising an electric furnace with thermostatic control containing a crucible made of graphite or

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S/072/62/000/011/001/001
B101/B186

A new method of measuring glass ...

gold, the latter intended for measurements in the 10^5 - 10^7 poise range. The glass specimen, a plane disc not less than 3 mm thick, is melted in the crucible and a rod of 1 mm diameter is forced into it by direct loading. The rod is off-centre with respect to the crucible so that several measurements can be carried out on the same specimen by rotating it through 45° . Using a microscope the depth of penetration is read off a scale; the time is measured with a stopwatch and the velocity is calculated. For viscosities up to 10^{12} poises, measurement takes 5 - 15 min; higher viscosities need 30 - 40 min. It is sufficient to read off depths of penetration of 0.8 - 1 mm. At viscosities below 10^{11} poises, penetration immediately takes place at constant velocity. At higher viscosities, the elasticity of the glass causes the velocity of penetration to follow a curve at first, and it does not become linear till later. The non-linear section, and the duration of the measurement, can be shortened by heavier loading. The viscometer was calibrated with optical glasses, and the diagram $\log \eta$ versus penetration rate (μ/min) was plotted for loads of 50 to 2000 g. Calibrations and measurements in the present investigation covered the $10^{8.5}$ - 10^{12} poise range. Using smaller loads, the range of measurement Card 2/3

A new method of measuring glass ...

S/072/62/000/011/001/001
B101/B186

could be extended down to $10^3 - 10^2$ poises. In the $10^5 - 10^7$ poise range the diameter of the test rod should be 4 mm, and its end entering the glass should be gold, to avoid wetting. Above 10^{12} poises, the rod should be made of very hard material, e. g. tungsten carbide, since loads of 3 - 10 kg are necessary. A further variation of this method would be to force a platinum sphere into the glass in a way similar to that as described by L. Shartsis, S. Spinner (Journ. Res. Nat. Bur. of Stand., 1951, v. 46, no. 3). There are 7 figures.

ASSOCIATION: Gosudarstvennyy opticheskiy institut im. S. I. Vavilova
(State Optical Institute imeni S. I. Vavilov)

Card 3/3

ACCESSION NR: AT4019312

S/0000/63/003/001/0167/0169

AUTHOR: Petrovskiy, G. T.; Krestnikova, Ye. N.; Grebenshchikova, N. I.

TITLE: Catalyzed crystallization of glasses of the lithium gallium silicate system

SOURCE: Simpozium po stekioobraznomu sostoyaniyu. Leningrad, 1962. Stekloobraznoye sostoyaniye, vy* p. 1: Katalizirovannaya kristallizatsiya stekla (Vitreous state, no. 1: Catalyzing crystallization of glass). Trudy* simpoziuma, v. 3, no. 1. Moscow, Izd-vo AN SSSR, 1963, 167-169

TOPIC TAGS: glass, glass crystallization, catalyzed crystallization, lithium silicate, gallium silicate

ABSTRACT: Lithium gallium silicate glasses containing various additives were investigated to determine the effect of composition on structure. The thermal expansion coefficients are tabulated for aluminum- and gallium-containing lithium silicate glasses and semi-crystalline samples, and the data are compared with data obtained by other investigators. Crystallization was effected for 8 hours at 950C. A glass with the composition $\text{Li}_2\text{O}-\text{Ga}_2\text{O}_3-6\text{SiO}_2$ had a large amount of the vitreous phase even after exposure to 1000C for ten hours. The thermograms for glasses of varying composition are given. Thermal analysis showed that because

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ACCESSION NR: AT4019312

of the high rate of heating, the crystallization temperatures determined by this method exceed the temperature at which the crystallization actually occurs. During the thermal treatment of lithium-gallium silicate glasses containing titanium dioxide, at 650C, a typical coloration of the glasses can be detected, the intensity of which can be reduced by the addition of certain oxides. The variations in the properties (such as the refractive index, dispersibility, density, and microhardness) during crystallization is shown by tabulated data for gallium glass. The heat capacity data show that the "defrosting" of the valency variations occurs at lower temperatures for gallium oxide than for aluminum oxide. Hence, the gallium glasses are more readily soluble than aluminum glasses, but the loss of transparency occurs at lower temperatures for gallium-containing ceramics. Orig. art. has: 1 figure and 2 tables.

ASSOCIATION: none

SUBMITTED: 17May63

DATE ACQ: 21Nov63

ENCL: 00

SUB CODE: MT

NO REF SOV: 007

OTHER: 004

Card 2/2

L 11269-63

EWP(q)/ENT(m)/BDS--AFFTC/ASD--Pq-4--MH

ACCESSION NR: AP3003766

8/0080/63/036/006/1205/1211

AUTHOR: Krestnikova, Ye. N.; Petrovskiy, G. T.

58

TITLE: Study of the viscosity of fluoride glass-forming systems

SOURCE: Zhurnal prikladnoy khimii, v. 36, no. 6, 1963, 1205-1211

TOPIC TAGS: BeF sub 2 glass-forming system, beryllium fluoride, BeF sub 2, AlF sub 3, KF, CaF, NaF, LiF, MgF sub 2, CaF sub 2, SrF sub 2, BaF sub 2, fluoride glass viscosity, GOI viscosimeter, fluoride glass two-component system, fluoride glass three-component system, fluoride glass volatility, fluoride glass crystallization, silica glass, oxygen-free glass, BeF sub 2 toxicity

ABSTRACT: The viscosity of beryllium fluoride-based glass-forming systems has been measured in the molten state and in the region of softening temperatures with GOI viscosimeters. The experiments were conducted with two-component systems containing 5, 10, 20, and up to 40 mol % alkali, alkaline-earth, or magnesium fluorides and with three-component systems containing up to 70 mol % AlF, and KF or up to 50 mol % KF and MgF₂. The temperature range of measurements in the molten state has an upper limit due to glass volatility and a lower limit due to

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ACCESSION NR: AP3003766

the onset of crystallization. Measurement of the viscosity of many of the glasses in the softening-temperature region is hindered by rapid crystallization. Only glasses with a high BeF_2 content exhibit a low crystallization capacity, making it possible to measure the viscosity within a wide temperature range (150–300 to 800–900°C). The results of the measurements given in the form of viscosity-temperature curves show that addition of the other fluorides to BeF_2 lowers the viscosity of the glass. Comparison of glasses containing 10% of the second fluoride shows that the viscosity-lowering effect increases in the order $\text{NaF}(\text{LiF}) < \text{CsF} < \text{KF}$ and $\text{BaF}_2 < \text{CaF}_2(\text{MgF}_2) < \text{SrF}_2$. Substitution of BeF_2 , KF , or MgF_2 in three-component systems with AlF_3 increases the viscosity. An increase in MgF_2 content in the BeF_2 - KF - MgF_2 system increases the viscosity at lower temperatures and reduces it at higher temperatures. The viscosities of beryllium fluoride-based glasses are lower than those of their structural analogs—silica glasses. Orig. art. has: 8 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 03Apr62

DATE ACQ: 07Aug63

ENCL: 00

SUB CODE: CH
nh/2/2
Card 2/2

NO REF SOV: 004

OTHER: 004

PETROVSKIY, G. T.; KRESTNIKOVA, Ye. N.; GREBENSHCHIKOVA, N. I.; PROSKURYAKOV, M. V.

3

"Structural interpretation of the possibility of obtaining glass-crystalline materials."

report submitted for 4th All-Union Conf on Structure of Glass, Leningrad,
16-21 Mar 64.

L 13559-66 EWP(*)/EWT(m)/EWP(b) GS/VH

ACC NR: AT6000500

SOURCE CODE: UR/0000/65/000/000/0327/0331

AUTHOR: Petrovskiy, G. T.; Krestnikova, Ye. N.; Grebenshchikova, N. I.; Proskurya-
kov, M. V.

ORG: None

TITLE: Structural interpretation of the possibility of creation of transparent
glass-crystal materials in various systems

SOURCE: Vsesoyuznoye soveshchaniye po stekloobraznomu sostoyaniyu. 4th, Leningrad,
1964. Stekloobraznoye sostoyaniye (Vitreous state); trudy soveshchaniya, Leningrad,
Izd-vo Nauka, 1965, 327-331

TOPIC TAGS: glass property, optic property, silicate glass

ABSTRACT: The authors survey ways for the creation of transparent glass-crystal
materials and report some recent investigations of their own concerning 1) the
experimental checking of the assumption that larger changes in glass viscosity above
660C can be explained by the inclusion of the bonds otherwise frozen in liquefaction
groupings; 2) the feasibility of transparent glass ceramics formation in $SiO_2-Bi_2O_3-$
 $SrTiO_3(BaTiO_3, PbTiO_3)$, $SiO_2-ZnO-K_2O$ and $SiO_2-B_2O_3-ZnO$, and beryllium oxide-contain-
ing systems; and 3) the role of polar and nonpolar components in lithium-gallium
silicate. All the results seem to confirm the previously proposed mechanism for the
production of transparent glass-ceramic material (G. T. Petrovskiy, I. M. Buzhind-
skiy, OMP, 4, 31, 1963) which required the simultaneous presence of cations which

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L 13559-66

ACC NR: AT6000500

during the heat treatment of glass increase and decrease, respectively, their coordination number. The crystallization process is determined not only by the catalyzer content but also by the ratio between the polar and nonpolar components. Orig. art. has: 4 figures and 1 table.

SUB CODE: 11, 20 / SUBM DATE: 22May65 / ORIG REF: 005 / OTH REF: 001

Cord 2/2

MATVEYEV, V. I., Eng., KRESTOV, A. P.

Refrigerators

Survey of standards for filling fish refrigerators. Ryb. khoz. 28 no. 8, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1951, ¹/₂ Unclassified.

KIMPH, A. R.

Proclamation No. 10, 1971, Commission 1, Article 1, [F. 10, 1971, 1971]
and [F. 10, 1971, 1971]. Moscow, 1971, 1971, 1971.

SO: Journal of American Association, Vol. 7, No. 1, July 1971.

KRESTOV, A.P., inzh.; LAZUNOVA, A.S., inzh.; REZNIKOVA, F.N.;
NOVIKOV, V.M., spets. red.; VELICHKO, Ye.M., red.

[Production of prepared, smoked and gastronomic products
from fish and raw materials other than fish] Proizvodstvo
kulinarnykh, kopchenykh, gastronomicheskikh rybnykh i ne-
rybnykh produktov. Moskva, Izd-vo "Pishchevaia promysh-
lennost'," 1964. 214 p. (MIRA 17:5)

1. ZVEREV, N.I. ; KRESTOV, B.D. ; ENG.

2. USSR (600)

4. Ash Disposal

7. Apparatus VTI for washing out ashes. Rab. energ. 2 no. 10, 1952

9. Monthly List of Russian Accessions, Library of Congress, JANUARY 1953. Unclassified.

POLYANIN, D.V.; ZOTOV, G.M.; GRYAZNOV, E.A.; MENZHINSKIY, Ye.A.; RUBININ, A.Ye.; CHEBOTAREVA, Ye.D.; ZAKHMATOV, M.I.; OKUNEVA, L.P.; SIMELEV, V.V.; STULOV, A.A.; POKROVSKIY, A.N.; SHIL'DKRUT, V.A.; IVANOV, A.S.; NABOROV, V.B.; FINOGENOV, V.P.; KUR'YEROV, V.G.; KHRAMTSOV, B.A.; BATYGIN, K.S.; BOGDANOV, O.S.; KROTOV, O.K.; GONCHAROV, A.N.; KRESTOV, B.D.; LYUBSKIY, M.S.; SOKOL'NIKOV, G.O.; KAMENSKIY, N.N.; YASHCHENKO, G.I.; SABEL'NIKOV, L.V.; GERCHIKOVA, I.N.; FEDOROV, B.A.; STEPANOV, G.P.; BORODAYEVSKIY, A.D.; INGATUSHCHENKO, S.K.; VARTUMYAN, E.L.; KAPELINSKIY, Yu.N., red.; MAYOROV, B.V., red.; NABOROV, V.B., red.; SOLODKIN, R.G., red.; DROZDOV, A.G., red.; ROSSHCHINA, L., red.; SOLOV'YEVA, G., mladshiy red.; CHEPELEVA, O., tekhn. red.

[The economy of capitalist countries in 1961; economically developed countries] Ekonomika kapitalisticheskikh stran v 1961 godu; ekonomicheski razvitye strany. Pod red. I.U.N. Kapelinskogo. Moskva, Sotsekgiz, 1962. 447 p. (MIRA 16:2)
(Economic history)

21085

3/186/60/002/006/007/026

A051/A129

21.4200

AUTHORS: Krasnov, K. S.; Krestov, G. A.

TITLE The volatility of francium compounds

PERIODICAL: Radiokhimiya, v. 2, no.6, 1960, 671 - 674

TEXT: The authors calculated the pressure curves of sublimation for all the halide compounds of francium, in order to provide data for establishing the possibilities of sublimation methods. These calculations were based on the high volatility of micro-quantities of francium chloride at 900 - 1,000 K (Ref. 2: Yu. B. Gerlit, P. I. Pavlitskaya, S. S. Roila, Khim. nauka i teorya, 4, 4, 466, 1969) and facilitated by the calculated series of thermodynamic characteristics of solid and gaseous compounds of francium. The authors also calculated the sublimation curves of rubidium and cesium halides to evaluate the possibilities of the method. The following equation was used for the calculations:

$$\Delta Z_T^0 = \Delta H_{298}^0 - T \Delta S_{298}^0 - T \int_{298}^T \frac{dT}{T^2} \int_{298}^T [(C_p)_{\text{gas}} - (C_p)_{\text{solid}}] dT \quad (1)$$

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The volatility of francium compounds

where ΔZ_f^0 is the change of the free potential in the sublimation process, ΔH_{298}^0 and ΔS_{298}^0 the change of the standard enthalpies and entropies in the same process, C_p the thermal capacity at constant pressure. The entropy change in the sublimation process ΔS_{298}^0 is determined as $(S_{298}^0)_{\text{gas}} - (S_{298}^0)_{\text{solid}}$.

The thermal capacity of the solid rubidium and cesium halides is expressed by the power series equation $C_p = a + bT$. The thermal capacity of the gaseous compounds was calculated from the quantum formula:

$$C_p = \frac{7}{2} R + C_E \left(\frac{\omega}{T} \right) \quad (2).$$

where $C_E \left(\frac{\omega}{T} \right)$ is the thermal capacity of the linear harmonic oscillator. The ω values were determined from the infra-red and micro-wave spectra; for the francium halides they were calculated from the value of the given mass. The sublimation curves within the temperature range of 300 - 1,000°K were calculated from the relation

$$-\Delta Z_f^0 = RT \ln P \quad (3).$$

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S/186/60/002/006/007/026

A051/A129

The volatility of francium compounds

An analysis of these results showed that the sublimation pressure is very low at usual temperatures and increases considerably at high temperatures. The fluoride is considered to be the most volatile of all the francium halides and cesium compounds. No decomposition of francium iodide into elements is expected in sublimation since $\Delta Z \neq 0$ holds true for this process. Iodides are more convenient for separation by sublimation than fluorides. This conclusion refers to macro-quantities of substances and cannot be unconditionally applied to micro-quantities of compounds. There are 3 tables and 15 references: 8 Soviet-bloc and 7 non-Soviet-bloc. The references to the English language publications read as follows: A. Hailig, M. Mandel, M. Stiech, C. Townes, Phys. Rev., 96, 3, 629, 1954; S. A. Rice, W. Klemperer, J. Chem Phys., 27, 2, 573, 1957; H. F. Barrow, A. D. Count, Proc. Roy. Soc., A, 219, 120, 1953; S. A. Rice, W. Klemperer, J. Chem. Phys., 27, 3, 643, 1957.

SUBMITTED: February 11, 1960.

Card 3/3

84630

S/076/60/034/010/011/022
B015/B064

11.4000

AUTHORS:

Yatsimirskiy, K. B., and Krestov, G. A.

TITLE:

Lattice Entropy of Compounds Formed From Monatomic
Ions Having the Structure of Inert Gases

PERIODICAL:

Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 10,
pp. 2263 - 2267

TEXT: Lattice entropy is of theoretical and practical importance since it forms the basis of calculating the free lattice energy from which, in turn, important data are obtained for various processes, e. g., dissolution, sublimation, etc. The lattice entropy of compounds originating from monatomic ions with the electron structure of an inert gas is calculated in the present paper on the basis of experimental data. To establish a relationship between the energy and the entropy of the crystal lattice, the authors studied the phase transition "crystal - gaseous ions" and introduce the definition of a "conditional" temperature of ion sublimation:

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Lattice Entropy of Compounds Formed
From Monatomic Ions Having the Structure
of Inert Gases

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$$T'_i = \frac{U_{298}}{\Delta S_{298}} \quad (3)$$

(U_{298} and ΔS_{298} = energy and entropy, respectively, of the crystal lattice at 298°K). When comparing the values for T'_i with those of the lattice energy, it is found that for each compound a concentration of points takes place on the curve (Fig), and that the respective section may be defined by the following equation:

$T'_i = \alpha U_{298} + \beta \quad (4)$ (α and β are constants of the single-type compounds). The values for α and β were calculated by the method of least squares for the three valency types 1 - 1, 2 - 1, and 2 - 2 of compounds (Table 3). The entropy of the crystal lattice is calculated from the following equation:

$$\Delta S_{298} = \frac{U_{298}}{\alpha U_{298} + \beta} \quad (5)$$

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Lattice Entropy of Compounds Formed
From Monatomic Ions Having the
Structure of Inert Gases

S/076/60/034/010/011/022
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The entropy of the crystalline compound was determined from the
equation

$$S_{298} = mS_{Mn+} + nS_{Xm-} - \Delta S_{298} \quad (6)$$

(m and n = stoichiometric coefficients of the equation of phase transition: S_{Mn+} and S_{Xm-} = entropy of gaseous ions under standard conditions for cation and anion). Equations (4) and (5) thus represent the relationship between the energy and entropy of the crystal lattice and the temperature of the phase transition "crystal-ionic gas". In some respect, there is an analogy with Trouton's rule. The entropy of 27 compounds was calculated from equations (5) and (6) (Table 4) and compared with the corresponding data from the handbook by Rossini et al. (Ref. 4). Equation (5) allows to calculate the lattice energy of substances for which no thermochemical data are available, but only the ionic radii (Table 5). A. F. Kapustinskiy is mentioned. There are 1 figure, 5 tables and 10 references: 8 Soviet, and 2 US.

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Lattice Entropy of Compounds Formed
From Monatomic Ions Having the
Structure of Inert Gases

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B015/B064

ASSOCIATION: Ivanovskiy khimiko-tekhnologicheskii institut
(Ivanovo Institute of Chemical Technology)

SUBMITTED: January 21, 1959

Table 3

1 Коэфф- иенты	2 Валентные типы соединений		
	1-1 MX	2-1 MX ₂	2-2 MX ₂
α	0,01428	0,00855	0,01125
β	755	1655	4210

Table 5

1 Соедине- ние	2 U_1	3 Соедине- ние	4 U_2	5 Соедине- ние	6 U_3
FrF	169,2	RaF ₂	546	MgTe	720
FrCl	149,6	RaCl ₂	470	CaTe	666
FrBr	144,4	RaBr ₂	461	SrTe	630
FrJ	130,8	RaJ ₂	431	BaTe	606
				RaTe	593

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S/076/60/034/011/005/024
B004/B064

11.5000

AUTHORS: Yatsimirskiy, K. B. and Krestov, G. A. (Ivanovo)

TITLE: Lattice Entropy of Compounds With Polyatomic Ions

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. 34, No. 11,
pp. 2448 - 2453

TEXT: In a previous paper (Ref. 1), the authors studied the entropy of the crystal lattice of compounds consisting of monatomic ions with the electron structure of inert gases. The equation $\Delta S_{298} = U_{298} / (\alpha U_{298} + \beta)$ (1) was derived. U_{298} is the energy; ΔS_{298} is the entropy of the crystal lattice; α, β are constants. This paper deals with compounds of monatomic cations having the electron structure of inert gases and polyatomic hydroxy anions. On the basis of the data of Refs. 2-4, the following values are determined for the crystal lattice entropy:

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Lattice Entropy of Compounds With Polyatomic Ions

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Table 1 (values in entropy units)

Compound	ΔS_{298}	Compound	ΔS_{298}	Compound	ΔS_{298}
NaNO_3	65.9	Li_2CO_3	100.64	MgCO_3	78.5
KNO_3	63.56	Na_2CO_3	96.9	CaCO_3	74.5
KClO_3	66.66	Na_2SO_4	98.0	SrCO_3	74.8
RbClO_3	66.8	K_2SO_4	95.1	BaCO_3	72.6
KBrO_3	68.9	Mg(OH)_2	103.42	MgSO_4	76.6
KClO_4	63.8	Ca(OH)_2	101.8	CaSO_4	74.5
RbClO_4	63.8	$\text{Mg(NO}_3)_2$	113.1	SrSO_4	73.2
CaClO_4	61.59	$\text{Ca(NO}_3)_2$	107.4	BaSO_4	72.1
KMnO_4	60.49	$\text{Ba(NO}_3)_2$	106.2	RaSO_4	71
		$\text{Ra(NO}_3)_2$	106.8	CaCrO_4	69.7

As compared with the experimental values, these values show a difference Δ . It is due to the rotation inhibition of the polyatomic ions in the crystal

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Lattice Entropy of Compounds With Polyatomic Ions

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which depends on the structure of the ion. $A = \eta \cdot S_{\text{rot}}$ (3) is derived (S_{rot} = rotational component of the entropy; η = degree of inhibition). For the polyatomic anions the values are given for A , S_{rot} , and $\eta = A/S_{\text{rot}}$:

Table 3, Values for A
Calculated From Equation (3)

Anion	A	S_{rot}	η
OH^-	6.2	-	-
NO_3^-	11.4	19.17	0.595
ClO_3^-	14.4	22.4	0.643
BrO_3^-	16.0	23.2	0.690
ClO_4^-	12.2	20.08	0.608
MnO_4^-	9.2	20.50	0.449
CO_3^{2-}	17.0	19.64	0.855

Continuation of Table 3:

Anion	A	S_{rot}	η
SO_4^{2-}	18.4	20.17	0.912
CrO_4^{2-}	15.1	20.55	0.735

For polyatomic ions (1) takes the form:
 $\Delta S_{298} = U_{298}/(\alpha U_{298} + \beta) + n\eta S_{\text{rot}}$ (4). n is the number of polyatomic ions in the compound. The values for α and β were taken from Ref. 1;

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Lattice Entropy of Compounds With Polyatomic Ions

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B004/B064

1-1
MX ($\alpha = 0.01428$, $\beta = 755$) 2-1
MX₂ ($\alpha = 0.00855$, $\beta = 1655$)

2-2
MX ($\alpha = 0.01125$, $\beta = 4210$). The entropy of the crystalline substances was calculated from the equation $S_{298} = mS_{M^{n+}} + nS_{X^{m-}} - \Delta S_{298}$ (5). m, n are the stoichiometric coefficients, $S_{M^{n+}}$, $S_{X^{m-}}$ is the entropy of the gaseous ions

Table 4 gives the values obtained for 66 compounds. There are 4 tables and 12 references: 9 Soviet and 3 US.

ASSOCIATION: Ivanovskiy khimiko-tekhnologicheskii institut (Ivanovo Institute of Chemical Technology)

SUBMITTED: February 7, 1959

Legend to Table 4: 1) Compound; 2) ΔS_{298} according to equation (4);
3) S_{calc} calculated from equation (5); 4) $S_{exp} - S_{calc}$: calculated from the modified equation of A. F. Kapustinskiy.

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Соедине- ние	$\Delta S_{\text{расч. по}}^{\text{теор.}}$ (4)	$S_{\text{расч. по}}^{\text{теор.}}$ (5)	$S_{\text{эксп.}}$	$S_{\text{расч.}} - S_{\text{расч.}}$	Соединение	$\Delta S_{\text{расч. по}}^{\text{теор.}}$ (4)	$S_{\text{расч. по}}^{\text{теор.}}$ (5)	$S_{\text{эксп.}}$	$S_{\text{расч.}} - S_{\text{расч.}}$
LiOH	63,6	9,7	12	+ 2,3	Mg(OH) ₂	104,3	14,2	15,09	+ 0,89
LiNO ₃	66,7	23,4	—	—	Mg(NO ₃) ₂	111,1	41,0	39,2	- 1,8
Li ₂ CO ₃	101,2	21,0	21,6	+ 0,6	Mg(ClO ₃) ₂ •	115,6	47,5	—	—
Li ₂ SO ₄	99,2	27,3	—	—	Mg(HrO ₃) ₂ •	119,4	51,1	—	—
NaOH	62,2	14,9	—	—	Mg(ClO ₄) ₂	110,6	50,7	—	—
NaNO ₃	65,6	28,1	27,8	- 0,3	Mg(MnO ₄) ₂ •	102,4	62,1	—	—
NaClO ₃	68,2	31,0	—	—	MgCO ₃	77,4	16,8	15,7	- 1,1
NaBrO ₃ •	70,0	32,8	—	—	MgSO ₄	76,0	21,9	21,9	0
NaClO ₄	64,8	33,5	—	—	MgCrO ₄ •	71,8	28,4	—	—
NaMnO ₄	61,6	38,3	—	—	Ca(OH) ₂	101,4	18,6	18,2	- 0,4
Na ₂ CO ₃	99,8	29,8	32,5	+ 2,9	Ca(NO ₃) ₂	108,5	45,1	46,2	+ 1,1
Na ₂ SO ₄	97,7	30,0	35,73	- 0,27	Ca(ClO ₃) ₂	113,8	50,8	—	—
Na ₂ CrO ₄	93,7	41,7	—	—	Cu(BrO ₃) ₂ •	117,6	54,4	—	—
KOH	60,9	17,6	—	—	Cu(ClO ₄) ₂	107,1	55,7	—	—
KNO ₃	64,4	30,9	31,77	+ 0,87	Ca(MnO ₄) ₂	100,9	65,1	—	—
KClO ₃	67,0	33,8	34,17	+ 0,37	CaCO ₃	75,5	20,2	21,2	+ 1,0
KBrO ₃ •	68,9	35,6	35,65	—	CaSO ₄	74,3	25,7	25,9	+ 0,2
KClO ₄	63,6	36,3	36,1	- 0,2	CaCrO ₄	69,7	32,0	32	0
KMnO ₄	60,5	41,0	41,04	—	Sr(OH) ₂	100,0	22,3	—	—
K ₂ CO ₃	97,1	35,7	—	—	Sr(NO ₃) ₂	107,1	48,8	—	—
K ₂ SO ₄	95,3	41,8	42,0	+ 0,2	Sr(ClO ₃) ₂	112,4	54,5	—	—

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R ₂ CrO ₄	91.2	47.6	—	—	Sr(BrO ₃) ₂ •	116.2	58.1	—	—
RbOH	60.5	20.3	—	—	Sr(ClO ₄) ₂	105.9	59.2	—	—
RbNO ₃	63.8	33.8	—	—	Sr(MnO ₄) ₂	99.7	68.6	—	—
RbClO ₃	60.5	30.6	30.3	-0.3	SrClO ₃	74.2	23.8	23.2	-0.0
RbBrO ₃ •	68.4	38.4	—	—	SrSO ₄	73.7	28.6	29.1	+0.5
RbClO ₄	63.1	39.1	38.4	-0.7	SrCrO ₄ •	69.4	34.6	—	—
RbMnO ₄	60.6	43.8	—	—	Ba(OH) ₂	98.9	24.8	—	—
Rb ₂ CO ₃	95.9	40.9	—	—	Ba(NO ₃) ₂	106.1	51.2	51.1	-0.1
Rb ₂ SO ₄	94.2	40.9	—	—	Ba(ClO ₃) ₂	111.5	56.8	—	—
Rb ₂ CrO ₄ •	90.2	52.6	—	—	Ba(BrO ₃) ₂	115.2	60.5	—	—
CsOH	59.8	22.3	—	—	Ba(ClO ₄) ₂	105.0	61.5	—	—
CsNO ₃	63.3	35.6	—	—	Ba(MnO ₄) ₂	98.8	70.9	—	—
CsClO ₃	66.0	38.4	—	—	BaCO ₃	73.3	26.1	26.8	+0.7
CsBrO ₃ •	67.8	40.3	—	—	BaSO ₄	72.4	31.3	31.3	+0.3
CsClO ₄	62.6	40.9	41.89	+1.0	BaCrO ₄	67.8	37.6	—	—
CsMnO ₄	59.5	45.6	—	—	Ba(OH) ₂ •	68.3	26.9	—	—
Cs ₂ CO ₃	94.8	45.1	—	—	Ru(NO ₃) ₂	105.0	53.2	52	-1.2
Cs ₂ SO ₄	93.1	51.1	—	—	Ru(ClO ₃) ₂	111.0	58.8	—	—
Cs ₂ CrO ₄ •	89.1	56.8	—	—	Ru(BrO ₃) ₂	114.7	62.5	—	—
FrOH	59.3	24.3	—	—	Ra(ClO ₄) ₂ •	104.5	63.5	—	—
FrNO ₃ •	62.9	37.5	—	—	Ra(MnO ₄) ₂ •	68.2	73.0	—	—
FrClO ₃ •	65.5	40.4	—	—	RaCO ₃ •	72.8	28.1	—	—
FrBrO ₃ •	67.4	42.2	—	—	RaSO ₄	73.1	32.1	34	+1.9
FrClO ₄ •	62.2	42.8	—	—					
FrMnO ₄ •	59.1	47.5	—	—					
Fr ₂ CO ₃	93.9	49.0	—	—					
Fr ₂ SO ₄ •	92.3	54.9	—	—					
Fr ₂ CrO ₄ •	88.3	60.6	—	—					

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KRESTOV, G.A.; YATSMIRSKIY, K.B.

Thermodynamic characteristics of complex compounds of cobalt (III)
of the chloropentammine type. Zhur.neorg.khim. 6 no.10:2294-
2303 0 '61. (MIRA 14:9)

(Cobalt compounds)

KRESTOV, G.A.; YATSIMIRSKIY, K.B.

Thermodynamic characteristics of complex compounds of cobalt (III)
with neutral additives. Zhur.neorg.khim. 6 no.10:2304-2311
O '61. (MIRA 14:9)

1. Ivanovskiy khimiko-tekhnologicheskii institut.
(Cobalt compounds)

KRESTOV, G.A.; KROSHKIN, V.I. (Ivanov)

Device for the synchronous start-up of a stop watch and an electric circuit. Zhur. fiz. khim. 35 no.3:670 Mr '61. (MIRA 14:3)

1. Ivanovskiy khimiko-tekhnologicheskii institut.
(Electric relays) (Electric switgear)

S/186/62/004/006/007/009
E075/E436

AUTHOR: Krestov, G.A.

TITLE: Thermodynamic characteristics of some compounds of francium

PERIODICAL: Radiokhimiya, v.4, no.6, 1962, 685-690

TEXT: Thermodynamic properties of Fr in the solid and gaseous states and in solution were calculated from the literature data in view of experimental difficulties in determining the properties. The enthalpies of formation of a number of solid Fr compounds were calculated from

$$\Delta H_{\text{salt}} = \Delta H_{\text{M}^+_{\text{gas}}} + \Delta H_{\text{X}^-_{\text{gas}}} - U \quad (3)$$

where U - crystalline lattice energy, $\Delta H_{\text{M}^+_{\text{gas}}}$, $\Delta H_{\text{X}^-_{\text{gas}}}$ and ΔH_{salt} - the changes of enthalpy during the formation of the gaseous ions M^+_{gas} , X^-_{gas} and that of the solid salt MX_{sol} . Using Pauling's equation, the enthalpy of formation of gaseous Fr ions was calculated to be 106.8 kcal/mole. For binary salts of Card 1/2

Thermodynamic characteristics ...

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alkali metals

$$\Delta H_{\text{bond}} = \gamma U \quad (7)$$

where ΔH_{bond} - enthalpy change at the formation of a gaseous salt from gaseous ions and γ - constant for compounds of the same type. For francium halides ΔH_{bond} , values are FrF - 119, FrCl - 105, FrBr - 101, FrI - 96 kcal/mole. The enthalpy change on hydration of Fr ions was calculated from

$$\Delta H_{\text{hydr}} = \frac{165.5 \times Z^2}{r + \ell} \quad (8)$$

where Z - ion charge, r - ion radius, ℓ - an added quantity equal to 0.8 for cations. The enthalpy of formation of aqueous Fr ions was calculated from ΔH_{hydr} and ΔH_{bond} and found to be -59.0 kcal/mole. The entropy of Fr ion was found to be about +33.2 e.u. Using the entropies ΔS° of crystalline Fr compounds the thermodynamic potential ΔZ° of the compounds was estimated from

$$\Delta Z^\circ = \Delta H^\circ - T \Delta S^\circ \quad (6)$$

SUBMITTED: September 9, 1961
Card 2/2

S/186/62/004/006/008/009
E075/E436

AUTHOR: Krestov, G.A.

TITLE: Thermodynamic characteristics of some compounds of
astatine and polonium

PERIODICAL: Radiokhimiya, v.4, no.6, 1962, 690-696

TEXT: Various methods were used to calculate thermodynamic
properties of At and Po compounds. The radii of the atoms were
obtained from

$$\frac{R_I}{R_{II}} = \text{constant} \quad (4)$$

where R_I and R_{II} - radii of two ions of the same type. The
radii of Po^{2-} , At^- , Fr^+ and Ra^{2+} were 2.26, 2.35, 1.78 and 1.52 Å
respectively, using the ionic radii given by Goldschmidt. The
radii of Po^{2-} and At^- were used to calculate the energy and entropy
of crystalline lattice of polonides and astatinides of alkali and
alkali-earth metals. The enthalpy change at the formation of
gaseous Po^{2-} and At^- ions were evaluated from the heats of
formation of the halogenides and chalcogenides of alkali and
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S/186/62/004/006/008/009

E075/E436

Thermodynamic characteristics ...

alkali-earth metals and were found to be -45.6 ± 3.0 kcal/mole for At^- and 115 ± 20 kcal/mole for Po^{2-} . The enthalpies of the formation of Po and At crystalline salts were calculated from

$$H = n\Delta H_{K^+} + m\Delta H_{A^-} - U \quad (6)$$

where ΔH_{K^+} , ΔH_{A^-} and ΔH are the enthalpy changes at the formation of gaseous cation, anion and crystalline salt respectively, U - energy of crystalline lattice and m, n - stoichiometric coefficients. Thermodynamic properties of gaseous At^+ , At^{2+} , Po^+ , Po^{2+} were calculated with the use of the ionization potentials given in the literature. The entropies of aqueous At_{aq}^- and $\text{Po}_{\text{aq}}^{2-}$ were 30.0 and 6.0 e.u. respectively. The entropies of the gaseous salts were calculated by the methods of statistical thermodynamics. The enthalpies of formation of gaseous NaAt , KAt , RbAt , CsAt and FrAt were determined from the bonding energy of the gaseous molecules and found to be -112, -103, -99, -95 and -93 kcal/mole. The thermodynamic potential changes ΔZ were obtained from the general formula

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$$\Delta Z = \Delta H - T\Delta S$$

Thermodynamic characteristics ...

S/186/62/004/006/008/009
E075/E436

where ΔH and ΔS are the enthalpy and entropy changes of the process at a temperature T . There are 6 tables.

SUBMITTED: September 22, 1961

Card 3/3

KRESTOV, G.A.

Problem of the structure of solutions of nonelectrolytes. Zhur.
strukt.khim. 4 no.1:18-21 Ja-F '63. (MIRA 16:2)

1. Ivanovskiy khimiko-tekhnologicheskii institut.
(Solvents) (Chemical structure)

KRESTOV, G.A.

Thermodynamic characteristics of structural changes of water
bound with the hydration of certain ions of rare earth elements
and actinides. Zhur.strukt.khim. 4 no.2:263-265 Mr-Ap '63.
(MIRA 16:5)

1. Ivanovskiy khimiko-tekhnologicheskii institut.
(Water) (Chemical structure) (Rare earths) (Actinide compounds)

KRESTOV, G.A.; KLOPOV, V.I.

Thermodynamic characteristics of the change of mobility of water molecules during the hydration of ions. Zhur.strukt.khim. 4 no.4: 507-513 JI-Ag '63. (MIRA 16:9)

1. Ivanovskiy khimiko-tekhnologicheskii institut.
(Ionic solutions) (Hydration) (Thermodynamics)

S/186/63/005/002/005/005
E075/E136

AUTHOR: Krestov, G.A.

TITLE: Thermodynamic characterization of atoms and ions of
the rare earth and actinide elements

PERIODICAL: Radiokhimiya, v.5, no.2, 1963, 258-270

TEXT: Calculations were carried out of the entropies,
enthalpies, ionization potentials and oxidation-reduction
potentials of the atoms and ions in the gaseous state and in
solution. The entropies of the gaseous particles were calculated
using

$$S_{\text{gas}} = 6.864 \log A + 26.00 + 4.576 \log \rho_0 = S_{3.T.} + 4.576 \lg \rho_0 \quad (2)$$

where: A - atomic or ionic weight;

ρ_0 - statistical weight of the lower electronic level;

$S_{3.T.}$ - Sackur-Tetrode entropy. The results indicate that the
electronic component of the entropies may reach 10% of the total
values. The entropy of tri- and tetravalent ions in solution were
calculated by Powell-Latimer equation. The values were used to
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Thermodynamic characterization of ... S/186/63/005/002/005/005
E075/E136

calculate the entropies of hydration for the ions. The enthalpy changes for the hydration of tri- and tetravalent ions were calculated using the following equations:

$$(\Delta H_{\text{hydr.}})_{M^{3+}} = \frac{3}{0.36} [(\Delta S_{\text{hydr.}})_{M^{3+}} - (\Delta S_{\text{hydr.}})_{La^{3+}}] + (\Delta H_{\text{hydr.}})_{La^{3+}} \quad (8)$$

$$(\Delta H_{\text{hydr.}})_{M^{4+}} = \frac{4}{0.36} [(\Delta S_{\text{hydr.}})_{M^{4+}} - (\Delta S_{\text{hydr.}})_{Ce^{4+}}] + (\Delta H_{\text{hydr.}})_{Ce^{4+}} \quad (9)$$

The values thus obtained were used to calculate the enthalpies of formation of gaseous ions with the aid of the equation:

$$\Delta H_{\text{gas}} = \Delta H_{\text{water}} - \Delta H_{\text{hydr.}} \quad (10)$$

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Thermodynamic characterization of ... S/186/63/005/002/005/005
E075/E136

Using recently available data for the heats of sublimation, calculations were made of the ionization potentials for some of the elements. The oxidation-reduction potential for the formation of tri- and tetravalent ions was calculated from the equation:

$$\pi^0 = - \frac{\Delta Z^0}{z \cdot F} \quad (12)$$

where π^0 - normal oxidation-reduction potential; z - number of electrons taking part in the reaction; F - Faraday number;

ΔZ^0 - free energy change during the reaction.

There are 7 tables.

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L 11877-63 EPF(n)-2/EWA(h)/ENT(1)/BDS AFFIC/ASD/SSD Pu-4
 ACCESSION NR: AP3002397 8/0153/63/006/002/0228/0232

AUTHOR: Krestov, G. A.

TITLE: Changes in the heat capacity in the hydration of monoatomic and polyatomic molecules

SOURCE: IVUZ. Khimiya i khimicheskaya tekhnologiya, v. 6, no. 2, 1963, 228-232

TOPIC TAGS: heat capacity, hydration, monoatomic ions, polyatomic ions

ABSTRACT: Assuming the electronic component to be 0, the author calculated the heat capacities of 29 monoatomic and 19 polyatomic ions in the gaseous state from their linear, rotational, and vibrational components. Frequencies used to calculate the vibratory component were taken from the literature. The change in heat capacity during hydration was calculated from this data and the heat capacities in aqueous solution. The contribution of the vibrational component of the heat capacity varied from 0-10 cal/degree mol. It was higher in ions such as perchlorate, sulfate, and phosphate and those in which the central atoms had higher atomic weights (sulfate, selenate). The heat capacity of isoelectric polyatomic gaseous ions increases with an increase in charge, with the exception of sulfite and chlorate ions. For monoatomic ions the relationship between ($\Delta C_{sub p}$) sub hydr, ionic radius, and charge is represented by the equation shown in the enclosure.

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ACCESSION NR: AP3002397

For polyatomic ions there is a linear relationship between (DELTA C sub p) sub hydr and 1/r. Since there is hardly any change in the vibrational and rotational components when polyatomic ions go from the gaseous state into solution, the (DELTA C sub p) sub hydr is almost the same for all of these ions. There is a sharp increase in heat capacity when the absolute value of the charge increases in polyatomic ions. The absolute value of change in heat capacity on hydration increased for monoatomic ions from the same sub-group of the periodic table. This increase was more marked for cations than for anions. The numerical value of the change in heat capacity also increased as the charge of monoatomic ions increased. Orig. art. has: 2 tables, 1 figure, and 7 formulas.

ASSOCIATION: Ivanovskiy khimiko-tekhnologicheskii institut (Ivanov Chemical Engineering Institute)

SUBMITTED: 09Feb62

DATE ACQ: 12Jul63

ENCL: 01

SUB CODE: 00

NO REP SOV: 008

OTHER: 001

Card 2/2

KRESTOV, G.A.

Change of heat capacity during the dissolution of compounds formed by monoatomic and polyatomic ions. Izv. vys. ucheb. zav.; khim. i khim. tekhn. 6 no.3:408-415 '63. (MIRA 16:8)

1. Ivanovskiy khimiko-tekhnologicheskii institut, kafedra neorganicheskoy khimii.

(Ions) (Solution (Chemistry)) (Heat capacity)

KRESTOV, G.A.

Change of entropy in the transition of monoatomic ions having the structure of inert gases from the crystalline and gaseous state to solution. Izv.vys.ucheb.zav.;khim.i khim.tekh. 6 no.5: 754-761 '63. (MIRA 16:12)

1. Ivanovskiy khimiko-tehnologicheskoy institut, kafedra neorganicheskoy khimii.

POBEDINSKIY, S.N.; KRESTOV, G.A.; KUZ'MIN, L.L.

Possibility of electrode processes taking place in the presence of the singly charged ions of alkaline earth metals. Izv.vys.ucheb.zav.; khim.i khim.tekh. 6 no.5:768-773 '63. (MIRA 16:12)

1. Ivanovskiy khimiko-tekhnologicheskij institut, kafedra tekhnologii elektrokhimicheskikh proizvodstv i kafedra neorganicheskoy khimii.

KRESTOV, G.A.

Partial molal quantities. Zhur. fiz. khim. 37 no.6:1406-1408
Je '63. (MIRA 16:7)

1. Ivanoskiy khimiko-tekhnologicheskii institut.
(Solution (Chemistry)) (Molecular weights)

KRESTOV, G.A.

Rational choice of the state of elements in calculating
 $\Delta H^{\circ}_{rev.}$ and $\Delta Z^{\circ}_{rev.}$ Zhur. fiz. khim. 37 no.12:2748-2751
D '63. (MIRA 17:1)

1. Ivanovskiy khimiko-tekhnologicheskii institut.

KRESTOV, G.A.

Change of the heat capacity during ionic sublimation of compounds with monoatomic and polyatomic ions. Izv.vys.ucheb.zav.;khim.i khim.tekh. 6
no.4:578-587 '63. (MIRA 17:2)

1. Ivanovskiy khimiko-tekhnologicheskii institut. Kafedra neorganicheskoy khimii.

KREKOV, G.A.; ABROSIMOV, V.K.

Thermodynamic characteristics of the structure changes in water caused by the hydration of ions at various temperatures. Zhur. strukt. khim. 5 no.4:510-516 Ag '64. (MIRA 18:3)

1. Ivanovskiy khimiko-tekhnologicheskii institut.

KRESTOV, G.A.; KLOPOV, V.I.

Thermochemistry of solvation of some sodium and potassium halides in mixed solvents. Zhur. strukt. khim. 5 no.6:829-833 N-D '64. (

(MIRA 18:4)

1. Ivanovskiy khimiko-tehnologicheskii institut.

KRESTOV, G. A.

Thermodynamic characteristics of water molecules in water. Zhur.
strukt. khim. 5 no.6:909-911 N-D '64. (MIRA 18:4)

1. Ivanovskiy khimiko-tekhnologicheskii institut.

KRESTOV, G.A.

Modified method of additive computation of the heat capacity
of ionic crystals. Izv. vys. ucheb. zav.; khim. i khim. tekhn.
7 no.5:751-757 '64 (MIRA 18:1)

1. Kafedra neorganicheskoy khimii Ivanovskogo khimiko-tekhnologicheskogo instituta.

KRESTOV, G.A.

Modified method for additive calculation of the change in heat capacity during ionic sublimation of crystals. Izv.vys.ucheb. zav.; khim.i khim.tekh. 7 no.6:924-929 '64.

(MIRA 18:5)

1. Ivanovskiy khimiko-tehnologicheskoy institut, kafedra neorganicheskoy khimii.

KRESTOV, G.A.

New means of expression for the concentrations of solutions.
Zhur.neorg.khim. 9 no.4:1013-1015 Ap '64. (MIRA 17:4)

1. Ivanovskiy khimiko-tehnologicheskoy institut, kafedra
neorganicheskoy khimii.

ACCESSION NR: AP4019517

S/0076/64/038/002/0338/0341

AUTHORS: Krestov, G.A. (Ivanovo)

TITLE: Concept of heat capacity in a crystal lattice and methods of its calculation

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 2, 1964, 338-341

TOPIC TAGS: crystal lattice heat capacity, ionic crystal, atomic crystal, complex crystal, crystal lattice, heat capacity calculation

ABSTRACT: The author refers to his previous work on the subject (Izv. vyssh. uchebn. zaved. 6, 4, 1963) wherein he defines the heat capacity of an ionic crystal lattice as the difference between the heat capacity of an ionic crystal and the heat capacity of the sum of gaseous ions comprising the crystal. This quantity can be described as the change in heat capacity due to the ionic sublimation. The definition for atomic lattices is analogous: change in heat capacity in the transition from an atomic crystal to an ideal atomic gas consisting of the same atoms at certain pressure p and temperature T . It can be called a change in heat capacity by an

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ACCESSION NR: AP4019517

atomic sublimation of crystals. Formulas are given and the values for dozens of substances have been calculated. Complex ions can be considered as a unit and treated as ionic crystals, following the same equations. The same principle is applied to metal lattices and their heat capacity defined as a change in the heat capacity of the metal in the transition to an ion and electron gas. The rule is also applicable to complex crystals with single crystal lattice or with complex lattice (crystal hydrates and others). Theoretical equations for calculating the heat capacity of the crystal lattice can be derived by differentiation of lattice energy equations. Orig. art. has: 10 formulas.

ASSOCIATION: Ivanovskiy khimiko tekhnologicheskii institut (Ivanovo
Institute of Chemical Technology)

SUBMITTED: 14Dec62

DATE ACQ: 31Mar64

ENCL: 00

SUB CODE: GP

NR REF SOV: 009

OTHER: 004

Card 2/2

KRESTOV, G.A.

Complete thermodynamic characteristics of electrode processes
involving rare-earth and actinide elements. Radiokhimiya 7
no.1:68-78 '65. (MIRA 18:6)

KRESTOV, G.A.; LAPIN, V.A.

Use of gaseous molecule frequencies for determining the heat capacity and entropy of alkali halide crystals. Teoret. i eksper. khim. 1 no.2:205-210
Mr-Ap '65. (MIRA 18,7)

1. Ivanovskiy khimiko-tekhnologicheskii institut.

KRESTOV, G.A.

Entropy characteristics of near and far hydration of ions of rare-earth and actinide elements, Radiokhimiia 7 no.3:305-310 '65. (MIRA 18:7)

KRESTOV, G.A.; LAPIN, V.A.

Heat capacity and entropy of some crystalline compounds of francium
and astatine in the 0 - 300°K temperature range. Radiokhimiia 7 no.3:
311-315 '65. (MIRA 18:7)

L 59242-65 ENT(1)/ENT(m)/ENG(m) JD/JN

ACCESSION NR: AP5015569

UR/0153/65/008/002/0224/0230

AUTHOR: Krestov, G. A.

TITLE: Heat capacity of gaseous ions at various temperatures

SOURCE: IVUZ. Khimiya i khimicheskaya tekhnologiya, v. 8, no. 2, 1965, 224-230

TOPIC TAGS: oxyanion, heat capacity, statistical thermodynamics, gaseous ion

ABSTRACT: The paper explores the possibility of using the methods of statistical thermodynamics for calculating the heat capacity C_p and C_v of gaseous polyatomic and complex ions. General formulas were derived for the computation of these quantities, and were used to compute C_p and C_v of 13 gaseous oxyanions for the 273.16-10,000K temperature range. The values obtained are tabulated. Certain regularities in the change of C_p and C_v with the nature of the ionic gas and with the temperature were observed. As the temperature rises, the numerical value of the vibrational component of C_v and C_p increases, more so at low temperatures than at high ones. This component also increases over a wide temperature range in a series of similar ions as the oxidation state of the central atom decreases (e.g., ClO_4^- , SO_4^{2-} , PO_4^{3-}) and as its atomic weight increases (e.g., ClO_3^- , BrO_3^- , IO_3^- , etc.). As a rule, the vibrational component increases with

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L-59242-65

ACCESSION NR: AP5015569

the charge. All these regularities are manifested most clearly at low temperatures. It was shown that when a certain temperature is reached, C_p and C_v of the ionic gas attain their maximum values, which are determined solely by the number of vibrational degrees of freedom. Orig. art. has: 2 tables and 13 formulas.

ASSOCIATION: Kafedra neorganicheskoy khimii, Ivanovskiy khimiko-tekhnologicheskii institut (Department of Inorganic Chemistry, Ivanovo Chemical Engineering Institute)

SUBMITTED: 25Mar63

ENCL:00

SUB CODE: IC, TD

NO REF SOV: 004

OTHER: 002

Card

2/2

KRESTOV, G.A.

Entropy of systems containing ions. Zhur. fiz. khim. 39 no. 5
1094-1097 My '65. (MIRA 18:8)

1. Ivanovskiy khimiko-tekhnologicheskiy institut.

KRESTOV, G.A.

Entropy changes during hydration of monatomic ions. Secret.
1 ekupor. khim. 1 no.4:479-487 '65. (MIRA 18:10)

1. Ivanovskiy khimiko-tekhnologicheskii institut.

KREKSTOV, G.A.

Change of entropy in the hydration of polyatomic and complex ions. Zhur. fiz. khim. 39 no.4:823-828 Ap '65.

(MIRA 19:1)

1. Ivanovskiy khimiko-tehnologicheskii institut. Submitted May 27, 1963.

KRESTOV, M.A.

[Finishing building interiors with gypsum panels] Vnutrenniaia
otdelka zdaniia obshivochnymy gipsovymi listami. M.A.Krestov.
Moskva, Gos. izd-vo lit-ry po stroitel'stvu i arkhitekture, 1953.
46 p. (MIRA 8:11)

1. Akademiya arkhitektury SSSR. Moscow. Institut stroitel'noy
tekhniki.

(Plaster board)

KRESTOV, M.A., redaktor; TKHILADZE, G.R., inzhener, nauchnyy redaktor;
BEGAK, B.A., redaktor; PERSON, M.N., tekhnicheskiiy redaktor.

[Technology of finishing work] Otdelochnaia tekhnika. Pod obshchei
red. M.A.Krestova. Moskva, Gos. izd-vo lit-ry po stroitel'stvu i
arkhitekture. No. 2. 1954. 82 p. (MLRA 7:11)

1. Akademiya arkhitektury SSSR, Moscow. Laboratoriya otdelochnykh
rabot.

(Façades) (Painting, Industrial)

VORONKOV, A.; CHARNY, S.; KASTEL, I.; KRESTOV, M.; MOISEYENKO, A.;
PALLADINA, G.A., red.izd-va; TOKER, A.M., tekhn.red.

[Industrialization of finishing work; a report] Industrializatsiia
otdelochnykh rabot; soobshchenie...[Moskva, Gos.izd-vo lit-ry po
stroit. i arkhitekt., 1955] 29 p. (MIRA 11:6)
(Building)

KRESTOV, M.A.

Repairing and cleaning building facades. Gor.khoz.Mosk.29
no.8:30-32 Ag '55. (MLRA 8:9)

(Buildings--Maintenance and repair)

KRESTOV, M.A.; DOBRYAKOVA, L.I.; KOSHKIN, V.G.; YEVDOKIMOV, A.A.;
IVANOVA, V.V.; KHEMELEVSKIY, V.A.; KOSTOCHKINA, T.V.; PFLAUMER,
O.E., kand.tekhn.nauk, nauchnyy red.; SEVORTSOVA, I.P., red.
izd-vo; TEMKINA, Ye.I., tekhn.red.

[Finishing large panels and blocks using colored concretes]
Otdelka krupnykh panelei i blokov s primeneniem tsvetnykh beto-
nov. Moskva, Gos.izd-vo lit-ry po stroit., arkhitekt. i stroit.
materialam, 1959. 87 p. (MIRA 13:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut novykh stroi-
tel'nykh materialov. 2. Institut novykh stroitel'nykh materialov
(for Krestov, Dobryakova, Koshkin, Yevdokimov, Ivanova, Khmelevskiy).
3. Institut betona i zhelezobetona (for Kostochkina).
(Building blocks)